

WE CLAIM:

1. A partner relay system comprising:

a first relay adapted to receive a first signal on a first wireless transmission resource, perform a first signal  
5 translation on the first signal to a second transmission resource, and re-transmit the first signal on the second wireless transmission resource;

a second relay in a spaced arrangement from said first relay adapted to receive the first signal on the second  
10 wireless transmission resource from the first relay, perform a second signal translation to re-translate the first signal to the first wireless transmission resource, and re-transmit the first signal.

2. A partner relay system according to claim 1 wherein  
15 each signal translation is an analog translation.

3. A partner relay system according to claim 2 wherein each signal translation is a frequency translation.

4. A partner relay system according to claim 1 wherein the first signal is a CDMA signal.

20 5. A partner relay system according to claim 1 wherein the first wireless transmission resource comprises a first forward link channel on a first carrier frequency, and the second wireless transmission resource comprises a second forward link channel on a second carrier frequency.

25 6. A partner relay system according to claim 1 wherein the first signal on the first wireless transmission resource comprises a CDMA signal on a first carrier frequency, and the first signal on the second wireless transmission resource comprises a CDMA signal on a second carrier frequency.

7. A cellular communication system for servicing a wireless station, the cellular communication system comprising a base station and the partner relay system of claim 1;

wherein the first signal is transmitted by the base station, and the second relay re-transmits the first signal for reception by the wireless station.

8. A partner relay system according to claim 1 wherein the first wireless transmission resource comprises a forward link channel on a first carrier frequency, and the second wireless transmission resource comprises a reverse link channel on the first carrier frequency.

9. A partner relay system according to claim 1 wherein the first wireless transmission resource comprises a first combined TDM/FDM resource, and the second wireless transmission resource comprises a second combined TDM/FDM resource.

10. A partner relay system according to claim 1 for use in a cellular communications system providing service to a wireless station, wherein the first relay comprises a first antenna for communicating with the cellular communications system, and a second directional antenna for communicating with the second relay, and wherein the second relay comprises a third directional antenna for communicating with the first relay, and a fourth antenna for communicating with the wireless station.

11. A partner relay system according to claim 1 wherein:

the second relay is further adapted to receive a second signal on a third wireless transmission resource, perform a third signal translation to translate the second signal to a fourth wireless transmission resource and re-transmit the second signal;

the first relay is further adapted to receive the second signal on the fourth wireless transmission resource from the second relay, perform a fourth signal translation to re-translate the second signal to the third wireless transmission resource, and re-transmit the second signal.

12. A partner relay system according to claim 11 wherein the first wireless transmission resource comprises a first forward link channel on a first carrier frequency, and the second wireless transmission resource comprises a second forward link channel on a second carrier frequency, and the third wireless transmission resource comprises a first reverse link channel on the first carrier frequency, and the fourth wireless transmission resource comprises a second reverse link channel on the second carrier frequency.

13. A partner relay system according to claim 11 for relaying signals between a first transceiver and a second transceiver and relaying signals between first transceiver and a third transceiver;

wherein said first signal is from the first transceiver to the second transceiver and is relayed via the first relay and then the second relay, said second signal is from the second transceiver to the first transceiver is relayed via the second relay and then the first relay;

wherein a third signal from the first transceiver to the third transceiver is relayed via the second relay and then the first relay, and a fourth signal from the third transceiver to the first transceiver is relayed via the first relay and then the second relay;

wherein each signal transmitted between the first relay and the second relay is subject to signal translation

prior to transmission by one of the relays and signal translation after reception by the other of the two relays.

14. A partner relay system according to claim 13 wherein said first and second signals are transmitted and relayed during first time slots, and said third and fourth signals are transmitted and relayed during second time slots.

15. A partner relay system according to claim 13 wherein the first wireless transmission resource is at least part of a first frequency band, the second wireless transmission resource is at least part of a second frequency band, the third wireless transmission resource is at least part of a third frequency band, and the fourth wireless transmission resource is at least part of a fourth frequency band.

16. A partner relay system according to claim 13 wherein each wireless transmission resource comprises at least one GSM channel.

17. A cellular communication system for servicing at least two wireless stations, the cellular communication system comprising a base station and the partner relay system of claim 13, wherein the first transceiver comprises the base station, and the second and third transceivers are wireless stations.

18. A partner relay system according to claim 11 wherein the first wireless transmission resource comprises a first combined TDM/FDM resource, and the second wireless transmission resource comprises a second combined TDM/FDM resource, the third wireless transmission resource comprises a third combined TDM/FDM resource, and the fourth wireless transmission resource comprises a fourth combined TDM/FDM resource.

19. A partner relay system according to claim 1 further comprising:

a third relay adapted to receive a second signal on a third wireless transmission resource, perform a third signal translation to translate the second signal to a fourth wireless transmission resource and re-transmit the second signal;

5           a fourth relay further adapted to receive the second signal on the fourth wireless transmission resource from the third relay, perform a fourth signal translation to re-translate the second signal to the third wireless transmission resource, and re-transmit the second signal.

10   20.       A partner relay system according to claim 19 wherein the first wireless transmission resource comprises a first combined TDM/FDM resource, and the second wireless transmission resource comprises a second combined TDM/FDM resource, the third wireless transmission resource comprises a third combined  
15 TDM/FDM resource, and the fourth wireless transmission resource comprises a fourth combined TDM/FDM resource.

21.       A partner relay system according to claim 1 further comprising:

20           a third relay adapted to receive a second signal on the second wireless transmission resource, perform a third signal translation to translate the second signal to the first wireless transmission resource and re-transmit the second signal;

25           a fourth relay adapted to receive the second signal on the first wireless transmission resource from the third relay, perform a fourth signal translation to re-translate the second signal to the second wireless transmission resource, and re-transmit the second signal.

22.       A method of relaying a signal comprising:

receiving a first signal on a first wireless  
transmission resource;

performing a first signal translation on the first  
signal to a second transmission resource and re-transmitting  
5 the first signal on the second wireless transmission resource;

receiving the first signal on the second wireless  
transmission resource;

performing a second signal translation to re-  
translate the first signal to the first wireless transmission  
10 resource and re-transmitting the first signal.

23. A method according to claim 22 further comprising:

receiving a second signal on a third wireless  
transmission resource;

performing a third signal translation to translate  
15 the second signal to a fourth wireless transmission resource  
and re-transmitting the second signal;

receiving the second signal on the fourth wireless  
transmission resource;

performing a fourth signal translation to re-  
20 translate the second signal to the third wireless transmission  
resource and re-transmit the second signal.